

MONTANA FISH, WILDLIFE & PARKS FINAL PROJECT PERFORMANCE REPORT

GRANT TITLE: Bat Surveys and Development of a Bat Conservation Plan for Montana
AGREEMENT: T - 9 - 1
PERIOD COVERED: May 27, 2003 through June 30, 2006

Objective

Objective of the original grant (approved 5/27/03): The objective of this grant is to develop a draft conservation plan for all bat species found in Montana, and conduct surveys to fill in critical data gaps on Townsend's big-eared bat and other bat species deemed species of concern (fringed myotis, spotted bat and pallid bat).

Objective of Amendment #1 (approved 5/14/04): The objective of this grant amendment is to identify and characterize trees within burned forests that are used by bats as roosts, and to examine differences in foraging activity between burned and unburned forests.

Location

The original grant agreement was a statewide project.

The project conducted under the grant amendment was conducted in the Boles Meadow area, located west of Placid Lake in the Seeley-Swan valley of west-central Montana.

Accomplishments

Accomplishments under the original grant included:

- Completion of a draft Montana Bat Conservation Plan (See included CD). This draft plan will be reviewed and edited by the Montana Bat Working Group during the fall and winter 2006, and completed for posting on the MFWP web site in Spring 2007.
- Townsend big-eared bat roost surveys were completed at the three known maternity colonies that are accessible. All three were occupied during the surveys. One site appeared to have about the same number of bats using it as during the previous check, the second site was checked for occupancy and no roost counts were done, and the third site (Lewis and Clark Caverns) experienced a large population decline from around 50-60 breeding females in recent years to about 16 breeding females in 2004, 2005, and 2006. The cause of the decline is unknown. Two additional maternity roosts reported in the past were not checked due to lack of access (private land, uncooperative landowner). Lactating females were captured at a previously unknown site in eastern Montana, and suspected to be roosting in a large cavity in steep badlands terrain. The roost site was not located. Single male bats were captured at several new sites, including private land under conservation easement along the Tongue River in southeastern Montana.
- Fringed myotis were captured at several new sites in eastern and western Montana, extending the known range of this species east to the Tongue River. Additional surveys may verify range connectivity with the population found in the Black Hills of South Dakota, that has previously been assumed to be an isolated population.
- A post-lactating eastern red bat was captured in northeastern Montana during August 2005, possibly representing the first verified breeding of this species in Montana (previous records were of migrating bats in September).

- Spotted bats were documented during acoustic surveys in several new locations that represented large range extensions, including the Missouri River (several locations in the Wild and Scenic section), the Beartooth Wildlife Management Area in Lewis and Clark County, and 2 locations in southwestern Montana (1 possible and 1 verified site in Madison County).
- Yuma myotis were thought to have been captured in central Montana, but the validity of the genetics analysis has been questioned, since acoustics work has since identified these as little brown bats. The genetics samples will be re-analyzed this winter, however the results may not be available in time for inclusion in the final plan. Analysis of genetic samples collected during a separate study conducted by the USFS during 2005 and 2006 may help clarify the range extent of this species. Those analyses have not yet been completed.
- Adult male and female and juvenile hoary bats were captured at several locations east and west of the Divide, dispelling prior conclusions by some researchers (based on very few museum specimens) that only male hoary bats were found in Montana during the breeding season.
- Data from most field surveys has already been entered into the Point of Observation (POD) database maintained jointly by MFWP and the Montana Natural Heritage Program. Remaining data (mostly from 2006) will be entered this fall. Additionally, a large body of bat data from other unpublished surveys conducted by a variety of state and federal agencies in the past was tracked down and entered into the POD database.

The study on bat use of burned forests was completed under the grant amendment (See included CD). Findings included the following:

- 121 bats of 8 species were captured, out of the 11 possible bat species present in western Montana.
- 3 maternity colonies of 3 different species (long-eared myotis, long-legged myotis, and silver-haired bat) were located in large snags within the burn boundary. Fire probably created roost sites for 2 of these 3 colonies.
- Of the 40 bats fitted with radio transmitters, roosting information was obtained for 29 bats. Of all roosting locations, 29 (33%) were in rocks, and 59 (67%) were in trees. The 59 trees included 3 trees and 4 stumps outside the burn boundary and 49 trees and 3 stumps inside the burn boundary.
- More than 1 roost location was found for 19 bats, with individual bats using from 1 to 7 different roost trees.
- Analysis was done on roost trees used by little brown bats and long-eared myotis, compared to random trees within the burn. The analysis found that trees selected by roosting bats were larger and closer to water than random trees.
- The diameter of randomly available trees averaged 25.3 cm, and ranged from 8.9 cm to 79 cm. Despite the apparent availability of numerous small diameter trees, the smallest diameter tree used as a bat roost was 15.5 cm, and all roost trees were between 15.5 and 127.3 cm in diameter, averaging 40.0 cm.
- With every increase of 10 trees greater than 31 cm per ha, the odds of use increase by 21% and the odds of use increase by 35% with an increase of 100 m of perennial stream surrounding the roost.
- Trees located only 100 meters closer to perennial water increased in the odds of use by 2.72, or almost 3 times. This result further strengthens the argument for retaining trees within streamside management zones (SMZ). Current SMZ guidelines require at least a 15.2- m buffer between water and tree harvesting activities. This research shows the average minimum distance between roost sites and perennial water to be 90 meters. If these SMZ guidelines were altered and the buffer distance increased even 50 additional

meters, adherence to the SMZ policy and improved management for bats could be met simultaneously.

- Potential prey sources (nocturnal insects) within burned forest were sampled with ultra-violet light traps and compared to adjacent unburned forest. The first year post-fire insect communities included the highest family richness (n=77) and experienced a dramatic increase in Diptera, Coleoptera, and Trichoptera numbers while Lepidopteran numbers remained equal among years and between burned and unburned sites.
- Twenty-eight insect families were restricted to burned sites and 16 families were found only in unburned sites. This research suggests burned forest provides highly productive insect habitat and may attract insectivorous predators like bats.
- Approximately 11,000 Anabat data files collected at a variety of sites around western Montana from 2003-2005 were analyzed by a private contractor. Most Anabat data was collected in conjunction with other activities (such as mist netting surveys). Eleven species were tentatively identified at all the sites combined. Bat activity levels ranged from zero to over 200 bat passes/hour. Insect sounds obscured bat calls at many sites, including many of the Boles Meadow sites. Tentative detections of unusual occurrences of Yuma myotis and some other species will require follow-up field surveys for verification (since some species are difficult to distinguish from others using the Anabat system).

Variances None

Expenditure Recap

Proposed:

	Federal Share		Match		Total
Direct Costs	52,066.00		20,611.40		72,677.40
Indirect @ 18%	9,767.20				9,767.20
Total	\$ 61,833.20	75.0%	\$ 20,611.40	25.0%	\$ 82,444.60

Actual:

	Federal Share		Match		Total
Direct Costs	52,218.83		20,611.40		72,830.23
Indirect (various rates)	9,614.37				9,614.37
Total	61,833.20	75.0%	20,611.40	25.0%	82,444.60

Budget Summary:

	Proposed	Actual
Fed Direct \$		
Bat Coordinator	14,000	14,000.00
Technician Salaries (2)	21,340	24,129.35
Mileage/travel	5,146	2,648.26
Professional Services		2,000.00
Equipment (Anabat Zcam, Bat Detectors, PIT tag reader and tag, Safety Supplies, Radio Transmitters, Minor Supplies)	10,580	8,763.39
Genetics Analysis Fees	1,000	525.00
Subtotal	\$ 52,066	\$ 52,066.00
Non-Federal Match \$		
Waived Overhead (UM)	15,754	15,790.98
MFWP staff time	9,065	10,142.14
MFWP purchased radios	1,275	1,470.00
MFWP purchased supplies	1,029	7,284.15
MFWP vehicle mileage & travel		1,241.63
In-kind spelunkers/volunteer time	1,381	1,329.44
In-kind PCT biologist time	1,899	2,730.10
Aerial flight donated by PCT		540
PCT donated field housing		800
Subtotal	\$ 30,403	\$ 41,328.44
TOTAL	\$ 82,469	\$ 93,394.44

The required 25% state match (\$20,620.11) was over-matched by \$20,708.33.

Project Personnel

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